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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/687,600	10/20/2003	Makoto Morishima	520.43227X00	2551
20457	7590	05/22/2006	EXAMINER	
ANTONELLI, TERRY, STOUT & KRAUS, LLP 1300 NORTH SEVENTEENTH STREET SUITE 1800 ARLINGTON, VA 22209-3873			ALEJANDRO, RAYMOND	
			ART UNIT	PAPER NUMBER
			1745	

DATE MAILED: 05/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/687,600

Applicant(s)

MORISHIMA ET AL.

Examiner

Raymond Alejandro

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11 May 2006.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-5 and 9-11 is/are pending in the application.  
4a) Of the above claim(s) 9-11 is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-5 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 20 October 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 3 IDS (see item 4).  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Election/Restrictions*

1. Applicant's election with traverse of Group I and Species 1 (claims 1-5) in the reply filed on 05/11/06 is acknowledged. The traversal is on the ground(s) that *"the alleged restriction is not between claims 9 and 10, but rather is between, e.g. claims 1 and 9. Clearly, the combination of claim 9 requires the subcombination of claim 1, and thus the combination as claimed in claim 9 requires the subcombination as claimed in claim 1"* and *"that the fuel cell assembly as recited in claim 9 requires the sheet-like chemical cell of claim 1"* and hence, *"consideration of both the Group I claims and Group III claims in the present application would not constitute an undue burden on the Examiner"*. This is not found persuasive because the particular search for the elected claims is not required for non-elected claims, that is, the search required for sheet-like chemical cell of Group I is (classified in class 204/282) is not particularly required for the fuel cell assemblies of Group III (classified in class 429/32). As admitted by the applicants, the inventive concepts involve both sheet-like chemical cell per se and the fuel cell assemblies themselves. Moreover, since the inventions relate to one another as combination and subcombination, it is further noted that the combination of Group II can have, for patentability purposes, either the specific sheet-like chemical cell of claim 1 as recited in claim 9 or a single electrolyte membrane cell as recited in claim 10. Thus, the requirement of AB<sub>sp</sub> and B<sub>sp</sub> is not satisfied. For example, B<sub>sp</sub> is the subcombination of Group I while B<sub>br</sub> is the subcombination recited in claim 10. Therefore, the foregoing is reasonable evidence to conclude that combination of Group III does not require the subcombination of Group I for patentability. Simply put, as per ***"MPEP 806.05(c) [R-3] Criteria of Distinctness Between Combination and Subcombination B.***

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***AB sp / AB br / B sp Restriction Proper***", the presence of a claim to combination ABsp does not alter the propriety of a restriction requirement properly made between combination ABbr and subcombination Bsp. Claim ABbr is an evidence claim which indicates that the combination does not rely upon the specific details of the subcombination for its patentability. If a restriction requirement can be properly made between combination ABbr and subcombination Bsp, any claim to combination ABsp would be grouped with combination ABbr. In this case, the subcombination is not essential to the combination. Additionally, the subcombination has separate utility such as providing a suitable membrane electrode assembly useful in multiple electrolytic applications such as electrolyzers and/or gas sensors.

The requirement is still deemed proper and is therefore made **FINAL**.

2. Applicant did not traverse the requirement for the election of species.

### ***Priority***

3. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Information Disclosure Statement***

4. The information disclosure statements (IDS) submitted on 05/11/06, 12/27/05 and 10/20/03 were considered by the examiner.

*Drawings*

5. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: 11, 13, 16, 19, 31-33, 35, 38, 39. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.
6. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "3" and "4" have both been used to designate the anode plate (*See description of Figure 6*). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

7. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "3" and "4" have both been used to designate the cathode plate (*See description of Figure 6*). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

8. The drawings are objected to because reference numeral 5 is not shown in Figure 6 (*it is noted that description of Figure 6 on page 19 recite that reference numeral 5 is shown in said figure*). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet"

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pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

9. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "27" has been used to designate both "the external anode terminal" and "the external cathode terminal" (*See paragraph bridging pages 20-21*). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### *Specification*

10. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," "This invention" etc.

11. The disclosure is objected to because of the following informalities: the term “*anode*” appears to be misspelled (“*abode*”) on page 19, line 17. Appropriate correction is required.
12. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

### ***Claim Rejections - 35 USC § 112***

13. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
14. Claims 1-5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
15. Regarding claims 1-5, the phrase “sheet-like” renders the claim(s) indefinite because the claim(s) include(s) elements not actually disclosed (those encompassed by “*like*”), thereby rendering the scope of the claim(s) unascertainable.
16. Claim 3 recites the limitation “said adjoining anode and cathode plates” in lines 6-7. There is insufficient antecedent basis for this limitation in the claim.
17. Claim 3 recites the limitation “said wiring sheets” in line 7. There is insufficient antecedent basis for this limitation in the claim. It is noted that claim 3 contains earlier recitation of either “an anode wiring plastic sheet” or “a cathode wiring plastic sheet”. However, it is unclear as to what specific “wiring sheets” (i.e. cathode or anode) the claim is intended to recite.



18. Claim 5 recites the limitation "the catalyst" in lines 1 and 3 (two occurrences). There is insufficient antecedent basis for this limitation in the claim.

19. Claim 5 recites the limitation "the main ingredient" in lines 2-3 and 4 (two occurrences). There is insufficient antecedent basis for this limitation in the claim. It would also be unclear whether the claim intends to recite that the main ingredient is the same or different for both electrode plates.

***Claim Rejections - 35 USC § 102***

20. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

21. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by the Japanese publication 2000-268836 (herein called the JP'836).

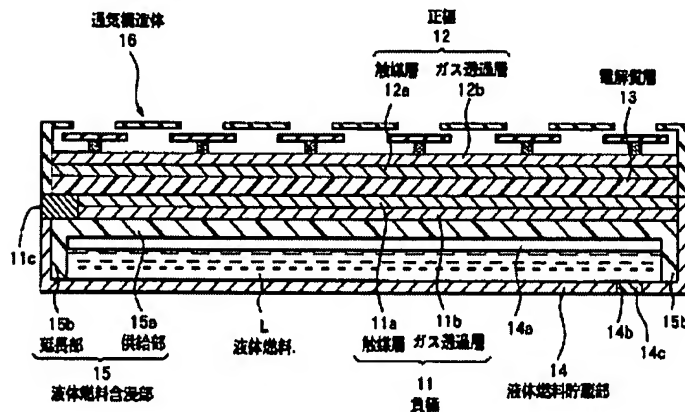
The present claims are drawn to a sheet-like chemical cell wherein the disclosed inventive concept comprises the specific plurality of electrode plates.

**Concerning claim 1:**

**Figure 1** below of the JP'836 illustrates a power generating device including a negative electrode 11 to oxidize the fuel and a positive electrode 12 to reduce the oxygen and are providing opposing each other with an electrolyte layer interposed therebetween (ABSTRACT/

See Figure 1). As illustrated in Figure 1 below, the positive electrode 12 consists of two electrode plates 12a and 12b; and the negative electrode 11 consists of two electrode plates 11a and 11b. *It is noted that the plurality of both negative electrodes and positive electrodes satisfy the claimed requirement of having opposed anode and cathode electrodes in pairs with the solid polymer electrolyte interposed therebetween. Thus, the electrochemical cell has a plurality of both negative electrodes and positive electrodes.*

【図1】



Thus, the present claim is anticipated.

22. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by the Japanese publication 09-223507 (herein called the JP'507).

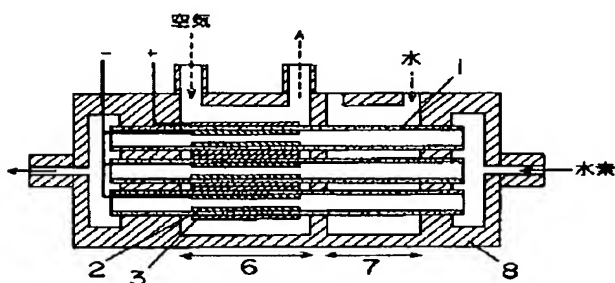
Concerning claim 1:

**Figure 4** below of the JP'507 illustrates a solid polymer fuel cell including a plurality of negative electrodes 2, a plurality of positive electrodes and solid polymer electrolytes 1 (Abstract/ See Figure 4). Particularly, a negative electrode is disposed on an inside surface of a solid polymer electrolyte and a positive electrode is formed on an outside surface thereof

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(Abstract/ See Figure 4). *It is noted that the plurality of both negative electrodes and positive electrodes satisfy the claimed requirement of having opposed anode and cathode electrodes in pairs with the solid polymer electrolyte interposed therebetween. It is further noted that the negative electrode performs the inherent function of oxidizing the fuel gas, and the positive electrode performs the inherent function of reducing the oxidant.*

【図4】



Thus, the present claim is anticipated.

23. Claims 1-2 and 4-5 are rejected under 35 U.S.C. 102(e) as being anticipated by Kidai et al 2005/0074651.

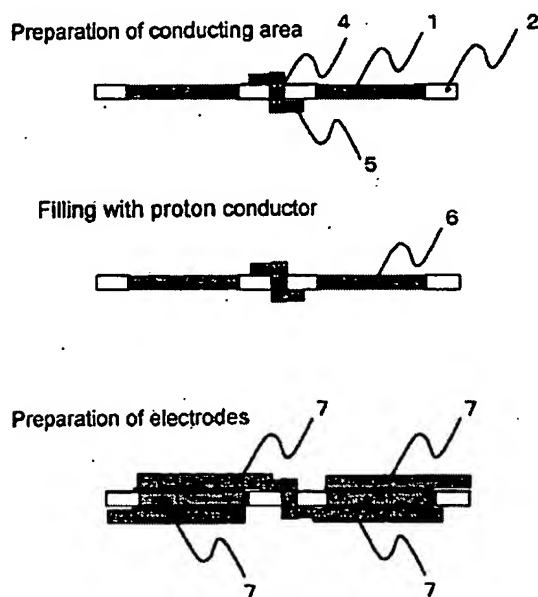
Concerning claims 1-2:

**Figure 6** below of Kidai et al depicts a polymer electrolyte membrane comprising a plurality of electrodes 7 consisting of respective electrode substrates and electrocatalyst layers (P.0058). It is disclosed that connections occur between the anodes and the cathodes located in the opposite sides of the polymer electrolyte membrane, wherein it is preferably to have a structure which interposes electron conductor the polymer electrolyte membrane (P0011). Reference numeral 5 represents the electron conductor through membrane (*the wiring member*

which electrically connects adjoining electrodes); reference numerals 1 and 2 represent respective porous area and non-porous area of the polymer electrolyte membrane (P0025-0031).

**Examiner's note:** It is noted that the plurality of both negative electrodes and positive electrodes satisfy the claimed requirement of having opposed anode and cathode electrodes in pairs with the solid polymer electrolyte interposed therebetween. It is further noted that the negative electrode performs the inherent function of oxidizing the fuel gas, and the positive electrode performs the inherent function of reducing the oxidant.

Fig. 6



**Concerning claims 4-5:**

Kidai et al disclose electrodes 7 consisting of respective electrode substrates and electrocatalyst layers (P0058). Particularly, Pt-supported carbon as the catalytic material; and organic solvents and also includes material contributing to ion conduction or an ion conductor which may be proton exchange resins (P0059). It is also disclosed that Pt and Ru, among others,

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are preferably used and the catalyst included in the electrocatalyst layer may include two different elements such as alloys thereof or a mixture thereof (P0060).

Thus, the present claims are anticipated.

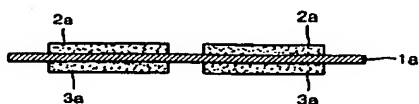
24. Claims 1-2 and 4-5 are rejected under 35 U.S.C. 102(e) as being anticipated by Choi 6689502.

As to claims 1-2:

**Figures 2B** below of Choi illustrates a conventional electrochemical cell comprising anodes 2a disposed at one side of an ion exchange membrane 1a and cathodes 3a disposed at the opposite sides (COL 2, lines 12-26). In order to electrically connect the respective cells, a connection wire 4 connecting anode 2a and cathode 3a of neighboring cells must pass through the ion exchange membrane 1a between the anode 2a and the cathode 3a. In this case, a path or hole for passage of the connection wire 4 must be provided in the ion exchange membrane 1a (COL 2, lines 12-26).

A conventional monopolar cell pack is constructed such that anodes 2a are disposed at one side of an ion exchange membrane 1a and cathodes 3a corresponding to the anodes 2a are disposed at the opposite side, as shown in FIGS. 2A and 2B. In order to electrically series-connect the respective cells, a connection wire 4 connecting the anode 2a and cathode 3a of neighboring cells must pass through the ion exchange membrane 1a between the anode 2a and the cathode 3a. In this case, a path or hole for passage of the connection wire 4 must be provided in the ion exchange membrane 1a. However, since the path or hole is likely to cause leakage of fuel, a path or hole portion should be sealed. If the connection wire 4 does not pass through the ion exchange membrane 1a, the connection wire 4 must be re-routed outside the cell pack.

**FIG. 2B (PRIOR ART)**



**Figure 9** also illustrates a plurality of first anodes 121 disposed in a row on a first surface of an ion exchange membrane, and a plurality of first cathodes 131 disposed on the second surface of the ion exchange membrane (COL 6, lines 45-50).

Concerning claims 4-5:

Choi discloses preparing a catalyst slurry by mixing a Pt-Ru catalyst for anode, and a Pt catalyst for cathode, an IPA solution and Nafion (the ion conducting polymer or the electrolyte), being deposited on a carbon black material (COL 8, lines 10-25).

Consequently, the present claims are anticipated.

***Claim Rejections - 35 USC § 103***

25. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

26. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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27. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over: a) Kidai et al 2005/0074651 and/or b) Choi 6689502 as applied to claim 1 above, and further in view of the Japanese publication 06-131918 (hereinafter referred to as the JP'918).

Kidai et al and Choi are both applied, argued and incorporated herein for the reasons expressed above. However, none of the preceding references fairly disclose the specific wiring sheet.

The JP'918 discloses that it is known to use flexible wiring sheet made of plastic materials (ABSTRACT) to provide a flexible wiring sheet hardly generating fluctuation of resistance value regardless of the entire length, hardly generating electromagnetic radiation to the outside caused by the impedance mismatching in a conductor, and to provide a structure suppressing electromagnetic radiation to the outside (ABSTRACT).

With these teachings, a person of ordinary skill in the art would have found obvious at the time the invention was made to use the specific wiring sheet of the JP'918 as the conducting connection of either Kidai et al and/or Choi because the JP'918 discloses several benefits of using it. For example, the JP'918 reveals that it provides a flexible wiring sheet hardly generating fluctuation of resistance value regardless of the entire length; hardly generating electromagnetic radiation to the outside caused by the impedance mismatching in a conductor, thereby providing a structure suppressing electromagnetic radiation to the outside.


***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Raymond Alejandro whose telephone number is (571) 272-1282. The examiner can normally be reached on Monday-Thursday (8:00 am - 6:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Raymond Alejandro  
Primary Examiner  
Art Unit 1745

  
**RAYMOND ALEJANDRO  
PRIMARY EXAMINER**